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AMENDMENTS IN THE CLAIMS:

1-5. (Canceled)

6. (Currently Amended) A low noise solid state thermostat, comprising:

a thermostat input operatively configured to be coupled to a temperature sensor;

a comparator for comparing an output of the temperature sensor to a predefined setpoint temperature;

solid-state switching circuitry operatively coupled to the comparator for selectively switching current to a thermostat output based on the comparison by the comparator; and

a ~~commercially available~~ microprocessor configured to monitor operation of the thermostat and to detect a fault in the operation,

wherein the microprocessor detects at least one of an open fault at the output of the thermostat, a short fault in the solid-state switching circuitry, an open fault in the solid-state switching circuitry, or an overtemperature fault.

7. (Original) The thermostat of claim 6, wherein the microprocessor detects a plurality of types of faults in the operation.

8. (Original) The thermostat of claim 6, wherein the microprocessor detects an open fault at the output of the thermostat.

9. (Original) The thermostat of claim 6, wherein the microprocessor detects a short fault in the solid-state switching circuitry.

10. (Original) The thermostat of claim 6, wherein the microprocessor detects an open fault in the solid-state switching circuitry.

11. (Currently Amended) ~~The thermostat of claim 6~~ A low noise solid state thermostat, comprising:

a thermostat input operatively configured to be coupled to a temperature sensor;

a comparator for comparing an output of the temperature sensor to a predefined setpoint temperature;

solid-state switching circuitry operatively coupled to the comparator for selectively switching current to a thermostat output based on the comparison by the comparator; and

a microprocessor configured to monitor operation of the thermostat and to detect a fault in the operation,

wherein the microprocessor detects at least one of a short fault in the temperature sensor or an open fault in the temperature sensor.

12. (Currently Amended) The thermostat of claim ~~[6]~~ 11, wherein the microprocessor detects an open fault in the temperature sensor.

13. (Original) The thermostat of claim 6, wherein the microprocessor detects an overtemperature fault.

14. (Original) The thermostat of claim 6, further comprising a reporting output for reporting detection of a fault to an external device.

15. (Original) The thermostat of claim 14, wherein the reporting output provides information indicative of the particular fault.

16. (Currently Amended) ~~The thermostat of claim 6~~ A low noise solid state thermostat, comprising:

a thermostat input operatively configured to be coupled to a temperature sensor;

a comparator for comparing an output of the temperature sensor to a predefined setpoint temperature;

solid-state switching circuitry operatively coupled to the comparator for selectively switching current to a thermostat output based on the comparison by the comparator; and

a microprocessor configured to monitor operation of the thermostat and to detect a fault in the operation,

wherein the microprocessor detects a fault in the temperature sensor based on a voltage across the temperature sensor.

17. (Currently Amended) ~~The thermostat of claim 6~~ A low noise solid state thermostat, comprising:

a thermostat input operatively configured to be coupled to a temperature sensor;

a comparator for comparing an output of the temperature sensor to a predefined setpoint temperature;

solid-state switching circuitry operatively coupled to the comparator for selectively switching current to a thermostat output based on the comparison by the comparator; and

a microprocessor configured to monitor operation of the thermostat and to detect a fault in the operation,

wherein the microprocessor detects an overtemperature fault based on another temperature sensor internal to the microprocessor.

18. (Currently Amended) ~~The thermostat of claim 6~~ A low noise solid state thermostat, comprising:

a thermostat input operatively configured to be coupled to a temperature sensor;

a comparator for comparing an output of the temperature sensor to a predefined setpoint temperature;

solid-state switching circuitry operatively coupled to the comparator for selectively switching current to a thermostat output based on the comparison by the comparator; and

a microprocessor configured to monitor operation of the thermostat and to detect a fault in the operation,

wherein the microprocessor detects a fault in the solid-state switching circuitry by counting pulses associated with operation of the solid-state switching circuitry.

19. (Original) The thermostat of claim 18, wherein the solid-state switching circuitry comprises first and second power transistors connected in series with the heating element.

20. (Original) The thermostat of claim 19, wherein the pulses are generated by current sense resistors connected in the series.

21-23. (Canceled)

24. (New) The thermostat of claim 6, wherein the microprocessor detects at least two of the different types of faults.

25. (New) The thermostat of claim 6, wherein the microprocessor detects at least three of the different types of faults.

26. (New) The thermostat of claim 6, wherein the microprocessor detects all of the different types of faults.

27. (New) The thermostat of claim 6, wherein upon detection of a fault, the microprocessor is configured to allow current to continue to flow to the thermostat output.

28. (New) The thermostat of claim 6, wherein upon detection of a fault, the microprocessor is configured to shut off current flow to the thermostat output.

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29. (New) The thermostat of claim 11, wherein the microprocessor detects a short fault in the temperature sensor.